

ern California with an abnormal pressure of about -0.20 covering Oregon. On the 27th the barometer fell generally from Idaho to Minnesota, and at midnight the lowest pressure was at Virginia City. On the morning of the 28th the abnormal isobar of -0.20 included Utah, northern Wyoming and part of Dakota, with the lowest pressure at Salt Lake City, 0.34 below the normal. During the day occasional light rains were reported in Montana and northwestern Dakota, and at midnight the barometer was lowest, 0.42 below the normal at Bismarck, with a well-defined centre in western Dakota. During the 29th, it moved northeastward into Manitoba, its passage marked by light rain in the Northwest, and by isolated cases of brisk, variable winds on Lakes Superior and Michigan. Cautionary Signals were displayed at Marquette on the morning and at Duluth and Escanaba on the afternoon of the 28th, and were lowered the morning of the 30th, having been fully justified at Duluth by a maximum velocity of NE. 32 miles.

No. XI.—The low pressure in the Gulf, consequent on area No. IX, recovered very slowly after the passage of that area, and on the morning of the 26th was nearly normal in the Western Gulf States. On that afternoon a slight general fall occurred from Arizona to Alabama, which continuing till the afternoon of the 27th, reduced the pressure in the Gulf to about 0.20 below the normal—Punta Rassa and St. Marks 0.21 below the normal and Indianola 0.17 below the normal. The pressure remained substantially unchanged until the afternoon of the 28th, when brisk easterly winds prevailed from Indianola eastward to St. Marks, and gentle south winds with cloudy weather and rain at Punta Rassa and Key West. At midnight the pressure had risen very slightly at the Gulf stations but the winds on the Texas coast changed to brisk northeasterly, and at Indianola attained a maximum velocity of NE. 33 miles. The pressure slowly declined at the morning and afternoon reports of the 29th, but rose slightly at midnight; partly cloudy weather and brisk northeast winds generally prevailed during the day with a maximum velocity of E. 32 miles at Indianola. During the 30th brisk northeast winds with cloudy weather and occasional rain prevailed from St. Marks to Indianola, while the barometer generally and slowly fell. On the morning of the 31st the fall continued, New Orleans reporting barometer 0.21 below the normal and brisk north and east winds prevailed from St. Marks to Brownsville with rain from New Orleans to Havana. Signals were ordered for Port Eads, Mobile, New Orleans, Galveston and Indianola. The fall continued steadily during the day. At midnight the New Orleans barometer was 0.29 below the normal; winds of 31 miles N. at Indianola, 28 N. at Galveston and 24 E. at New Orleans had been reported during the day. At midnight signals were yet flying, having been fully justified, except possibly at Mobile. A special report of the wind at Port Eads covering seventy-one hours, ending 10 a. m. of the 31st, gives the mean velocity during that time as $28\frac{1}{2}$ miles per hour, attaining a maximum of 35 miles ENE. at 7 a. m. and NE. 35 at 9 a. m. of the 30th. The wind blew steadily from ENE. from 11 a. m. of the 28th till 10 a. m. of the 30th, and for the succeeding 24 hours from the NE. Such steadiness of velocity and direction had never before been known at that point.

INTERNATIONAL METEOROLOGY.

On Chart No. IV. are shown the probable tracks of storm-centres over the oceans, deduced from data received at this office up to August 5th, 1879, and in the upper right-hand corner will be found an index to the same. Below is a brief notice of the above, and also of some storms over the Southern Hemisphere:

North Atlantic Ocean.—No. I. is a continuation of the secondary depression attending area of low barometer No. II. of the *June Review*; on the 8th and 9th of June it was central to the north of Newfoundland, and on the 10th probably passed to the north-northeast inducing the S. and SW. winds and rain reported on that day in 50° N. 41° W. No. II. probably originated on this day (the 10th) in the southern quadrant of the preceeding depression or about 40° N. 50° W. and is the extended track of storm No. V. given on Chart No. VII of the *July Review*. On the 11th, its centre was apparently indicated in about lat. 43° N 43° W; on and after the 12th, its track was about as previously shown, although reports since received, change the position for the 12th and 13th a little towards the south. No. III probably originated in about 45° N. 15° W. on June 10th, in the south quadrant of No. II *July Review*, although as the reports from the Azores are not yet to hand, this may be considered somewhat doubtful. No. IV was central on June 30th, about 53° N 20° W, having probably developed in the south-west quadrant of area No. VI, *July Review*; it passed over the British Isles on the 1st and 2nd of July, during which days north-westerly gales and high seas were experienced from 20° to 30° W and about 50° N. No. V is a continuation of area of Low Barometer, No. I chart, No I, described in the *July Review*; on the 4th, it passed south of Newfoundland, and on the 5th, was probably joined by No. VI from Labrador; on the 5th, the centre was probably more to the north than indicated, but high seas were reported from 30° to 50° W and between 44° and 50° N; 6th and 7th, "terrific" westerly gales and high seas were reported between 20° and 30° N and 50° to 55° W; S. S. Leipzig, on the 7th, in 50° N 16° W, and on the 8th, in 50° N 18° 30' W, reports, "7th and 8th, had very heavy gales, with rain, from south-west to west and north-west, and high rough seas." No. VII is a continuation of area of Low Barometer, No. II, (chart No. I,) of *July Review*; on the morning of the 10th, it was central near Cape Breton, and on the morning of the 11th south of Newfoundland; southerly gales and high seas were reported off the banks of Newfoundland, in advance of the center of depression, which, as it moved eastward, was followed, on the 11th, by dense fogs; at 8 p. m., S. S. Virginia, was wrecked on Sable Island; 12th and 13th, it was north-east of Newfoundland, and on the 14th and 15th, developed into a quite severe storm about 50° N 30° W; on the 16th it passed south of Ireland, and on the 17th, was dissipated over Western Europe. No. VIII is a continuation of area of Low Barometer, No. VI, (chart I) *July Review*, and was north of Newfoundland on the 25th, but after this

its track may be considered doubtful and farther north than as shown on chart. *South Pacific Ocean*.—Ship David Crockett, from New York to San Francisco, reports "passed Cape Horn May 28th, 1879, and took fearful gale from W. to SW., lasting 12 days, with fearful squalls of hail and snow and fearful high sea, and on June 9th had drifted back to Cape St. John, Staten Island; sustained considerable damage to rigging and did not get past Cape Horn the second time, until June 11th." Ship Ellen Sharp, from Melbourne at San Francisco, August 7th, reports "lost topsails, &c., in hurricane June 16th, 1879." Bark B. L., from San Francisco, put into Auckland June 11th, 1879, with pumps choked, and sailed thence for Lyttleton, N. Z., on the 14th; was wrecked at Timaru, New Zealand, June 29th, at 11 p. m., during heavy SE. gale; "the master was not able to get any observations for 3 days previous;" a tug was dispatched from Christ Church, but could not reach wreck on account of tremendous sea. Ship Frank Pendleton, from San Francisco at Deal, England August 7th; shipped heavy seas off Cape Horn during which two of her crew were drowned. *Indian Ocean*.—Ship Victoria Cross, encountered stormy weather May 21st, 1879, in lat., 43°S, 61°E; sea broke over vessel, started deck house and damaged boats. Barque Caroline, June 11th and 12th, 1879, in 30° to 31° S. and 57° to 58° E. had a terrific gale from N. to WNW., with hard squalls, heavy rain, and a high sea—barometer 29.50. At Mauritius on the 11th, it was "getting gloomy at SSE'd" and on the 12th the pressure fell to 29.98 with a westerly wind and light rain. *Bay of Bengal*.—On chart No. IV is shown the track of a slight depression which probably moved northward over northern India, from May 30th to June 6; it was accompanied by heavy rain (nearly 7.00 inches) at Cuttack on the 30th, and severe gale at Darjeeling on the 5th.

TEMPERATURE OF THE AIR.

The isothermal lines upon Chart No. II., show the general distribution of the temperature for August 1879. By reference to the table of average temperatures given on the same chart, it will be seen that there has been a general deficiency as compared, with the means for many years, in all districts east of the Rocky Mountain slope, except Florida, which shows a normal temperature, and the northern Rocky Mountain slope, which shows a slight excess. The greatest deficiencies are reported from the Gulf States, especially Texas, Tennessee and the Ohio valley and the New England States. The smallest from the Lake region, Lower Missouri valley, and Middle Eastern Rocky Mountain slope. An excess is reported from the plateau districts and the Pacific coast, except at San Diego, where it is normal.

Maxima and Minima Temperatures.—Upon charting the maxima temperatures of the month it appears that throughout the country generally, the range was from 90° to 99°. At isolated stations on the Atlantic coast from Maine to North Carolina and in the Lake region, maxima temperatures ranging from 81° to 89° were reported. The lowest maximum on the Atlantic coast was 81° at Cape Lookout, and in the Lake region 82° at Buffalo. The lowest maximum on the Pacific coast was 81° at San Diego. The line of maxima temperatures of 100° and above confines within its limits all of Texas except the coast stations, the southern half of Arizona and the interior of California. The highest reported temperature during the month from the Signal Service stations was 115° at Yuma, Arizona.

Upon charting the minima temperatures for the month it is found that, excepting at the elevated stations, but one station—Marquette, 37°—reported a minimum temperature of less than 40°. The area of from 40° to 50° included the interior portion of New England, excepting isolated southern stations, the northern portion of the Upper Mississippi valley, the Northwest and Northern Rocky Mountain Slope. The area from 60° to 70° comprises within its limits the Middle Atlantic States, Virginia, the interior of North Carolina, Tennessee and the Ohio valley, Central Mississippi valley, the Lower Missouri valley, Nebraska and Indian Territory, portions of Texas and Arizona and California. The only minima temperatures above 70°, yet reported, are 71° at Galveston and Indianola, and 72° at Tucson, Arizona.

Minima and Maxima Temperatures are respectively as follows: *Maine*: 43° at *Orono, 49° at Eastport and 93° at Portland. *Vermont*: 43° at *Lunenburg, 45° and 90° at Burlington and 97° at *West Charlotte. *Massachusetts*: 46° at *Springfield Armory and 51° at Thatcher's Island, 94° at Boston and 100° at *Somerset. *Rhode Island*: 55° and 87° at Newport. *Connecticut*: 49° to 89° at New Haven and 97° at *Mystic. *New York*: 42° at *Waterburg, 48° at Rochester, 90° at New York City, and 98° at *Starkey. *Pennsylvania*: 38° at *Franklin, 50° at Pittsburgh, 93° at Philadelphia, and 97° at *Chambersburg. *Delaware*: 60° and 90° at *Dover. *Maryland*: 50° at *Woodstock, 56° and 92° at Baltimore. *District of Columbia*: 55° and 96° at Washington. *Virginia*: 45° at *Snowville, 57° and 95° at Lynchburg. *West Virginia*: 51° and 85° at Morgantown. *North Carolina*: 46° at *Highlands, 56° at Charlotte, 98° at Wilmington and Weldon. *South Carolina*: 60° at *Spartanburg, 62° and 95° at Charleston. *Georgia*: 56° at McPherson Barracks, 64° at Augusta and 97° at Savannah. *Florida*: 62° at *Ft. Barrancas, 65° and 91° at St. Marks and 102° at *Houston. *Alabama*: 59° at *Wilsonville, 37° and 94° at Mobile. *Mississippi*: 62° at *Fayette, 62° and 97° at Vicksburg. *Louisiana*: 61° and 96° at Shreveport and 98° at *Pt. Pleasant. *Texas*: 48° at Fort Davis and 105° at Pilot Point. *Ohio*: 44° at *Westerville and *Urbana, 56° and 96° at Cincinnati. *Kentucky*: 57° and 96° at Louisville. *Tennessee*: 50° at Knoxville and 96° at Nashville. *Arkansas*: 61° and 96° at Little Rock. *Michigan*: 34° at *Lansing, 37° at Marquette and 96° at *Lansing and Marquette. *Indiana*: 46° at *Wabash, 53° and 93° at Indianapolis and 95° at *Logansport. *Illinois*: 45° at *Riley, 52° and 91° at Chicago and 100° at *Louisville. *Missouri*: 47° and 100° at *Kansas City, 55° and 99° at St. Louis. *Kansas*: 49° at *Lawrence, 55° and 95° at Dodge